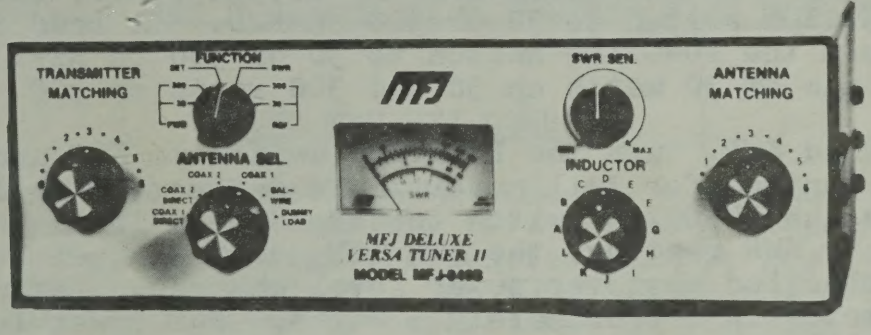
MFJ Deluxe Versa Tuner II

MODEL MFJ-949B



OWNER'S MANUAL

CAUTION: Read All Instructions Before Operating Equipment.

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1200-0031 Rev. 1

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MFJ-949B DELUXE VERSA TUNER II INSTRUCTIONS

GENERAL INFORMATION

The MFJ-949B is designed to match virtually any transmitter to almost any antenna, including dipoles, inverted vees, verticals, mobile whips, beams, random wires, and others fed by coax line, balanced lines, or a single wire. A 1:4 balun is built in for connection to balanced lines. An antenna selector switch provides versatile antenna selection. A 50 ohm dummy load is built in for easy transmitter tuning. The MFJ-949B will handle up to 300 watts of RF output power from the transmitter from 160 through 10 meters. The SWR, forward power and reflected power meter provide measurement for SWR, forward and reflected power in watt.

THE SWR/WATTMETER

The meter on the MFJ-949B can be used with the tuner or by itself. To use the meter without the tuner set the Antenna SELECTOR to Coax 1 Direct or Coax 2 Direct.

To read forward transmitter RF output power, simply turn the meter FUNCTION switch to 30 or 300 on FWD. To read reflected power simply turn the FUNCTION switch to 30 or 300 on REF. The meter will read maximum of 30 watts on 30 and 300 watts on 300.

To read SWR, turn the FUNCTION switch to SET and adjust the SWR SEN. control for full meter scale deflection while transmitting, then turn the FUNCTION switch to SWR to read SWR. In order to have an accurate SWR reading, the SWR SEN. control must be set for full scale deflection whenever power level changes. Maximum sensitivity for the meter is approximately 5 watts. For power less than 5 watts, the SWR will not read accurately, however, minimum reading in the SWR position is minimum SWR. NOTE: The meter on the MFJ-949B is not intended for precision measurement. If precision measurement is desired, a precision meter must be used.

THE ANTENNA SELECTOR

The ANT. SELECTOR switch allows selecting two coax antennas either direct or thru tuner, a balanced line antenna or wire antenna or a built in 50 ohm dummy load. The 50 ohm dummy antenna is rated at 200 watts. CAUTION: DO NOT continuously key for more than 2 minutes at a time. DO NOT operate the antenna selector switch while transmitting. DO NOT use the MFJ-949B for over 300 watts of RF output power, even in the Direct Coax or Dummy Load positions.

INSTALLATION

1. Install the MFJ-949B between the transmitter and the antennas. A coax line is connected to the transmitter and the SO-239 coax connector marked TRANSMITTER on the tuner.

2. One or two coax fed antenna may be connected to the SO-239 coax connectors marked Coax 1 and Coax 2. NOTE: Coax 1 and Coax 2 antennas can be connected directly to the transmitter and by-passing the tuner by setting ANT. SELECTOR to Coax 1 Direct or Coax 2 Direct, respectively.

3. A random wire antenna may be connected to the five-way binding post marked WIRE. The random wire should be long, high, and as clear of surrounding objects as possible. For optimum operation, length of random wire antenna should be quarter wave or longer of the operating frequency. Do not ground the random wire antenna. Make sure that the tuner is well grounded to the transmitter. A five-way binding post marked GROUND is provided for ground connection.

4. A balanced line fed antenna may be connected to the two five-way binding posts marked BALANCED LINE. A jumper wire from the WIRE binding post, as indicated by a dotted line on the MFJ-949B This couples the MFJ-949B to the balanced line through a 1:4 balun.
NOTE: Either a balanced line or random wire antenna can be connected at one time. If a random wire antenna is used, make sure that there is not a jumper wire between WIRE and BALANCED LINE.

USING THE MFJ-949B

The INDUCTOR switch on the MFJ-949B presents a minimum of inductance at position A and a maximum of inductance at position L. Less inductance is needed at high frequencies than at low frequencies for the same impedance. The TRANSMITTER and ANTENNA controls both present a maximum of capacitance at position 0. For optimum operation of the MFJ-949B, the transmitter must be tuned for a 50 ohm output impedance for the frequency band in operation. Set ANT. SELECTOR switch to Dummy Load for tuning up the transmitter. NOTE: Always tune the transmitter at a low output power.

After properly tuning the transmitter, set ANT. SELECTOR to the desired antenna and tune the tuner for a minimum SWR as described below. DO NOT readjust the transmitter loading control settings after loading it to the 50 ohm load.

1. Set the TRANSMITTER and ANTENNA controls to 3.5 (The capacitors are half-opened).

2. Rotate the INDUCTOR control unitl maximum noise is obtained with your transceiver in the receiving mode.

3. Set FUNCTION switch to SET. Set transmitter to the tune position and transmit.

4. Turn the SWR SEN. control clockwise for a full meter scale deflection. If a full-scale deflection cannot be obtained, increase the output power from the transmitter.

5. Turn the FUNCTION switch to SWR for SWR reading.

6. If the SWR is not 1:1, then tune the MFJ-949B for a minimum SWR.

7. While transmitting and with the INDUCTOR control set the same as for step 2, alternately adjust the TRANSMITTER and ANTENNA controls for a minimum SWR. Since the TRANSMITTER and ANTENNA controls interact, the two controls can best be adjusted by turning the TRANSMITTER control a small increment at a time and then rotating the ANTENNA control for the minimum SWR. Repeat this until a minimum SWR is obtained.

8. If a SWR reading of 1:1 is not achieved, increase or decrease the INDUCTOR control one position and repeat Step 7.
CAUTION: If arcing between capacitor plates occurs, increase or decrease the INDUCTOR control one position and repeat Step 7.
NOTE: If a SWR 1:1 cannot be achieved at this point, repeat Step 7 for each INDUCTOR control position. Again, do this in the tune mode or at a low transmitter power.

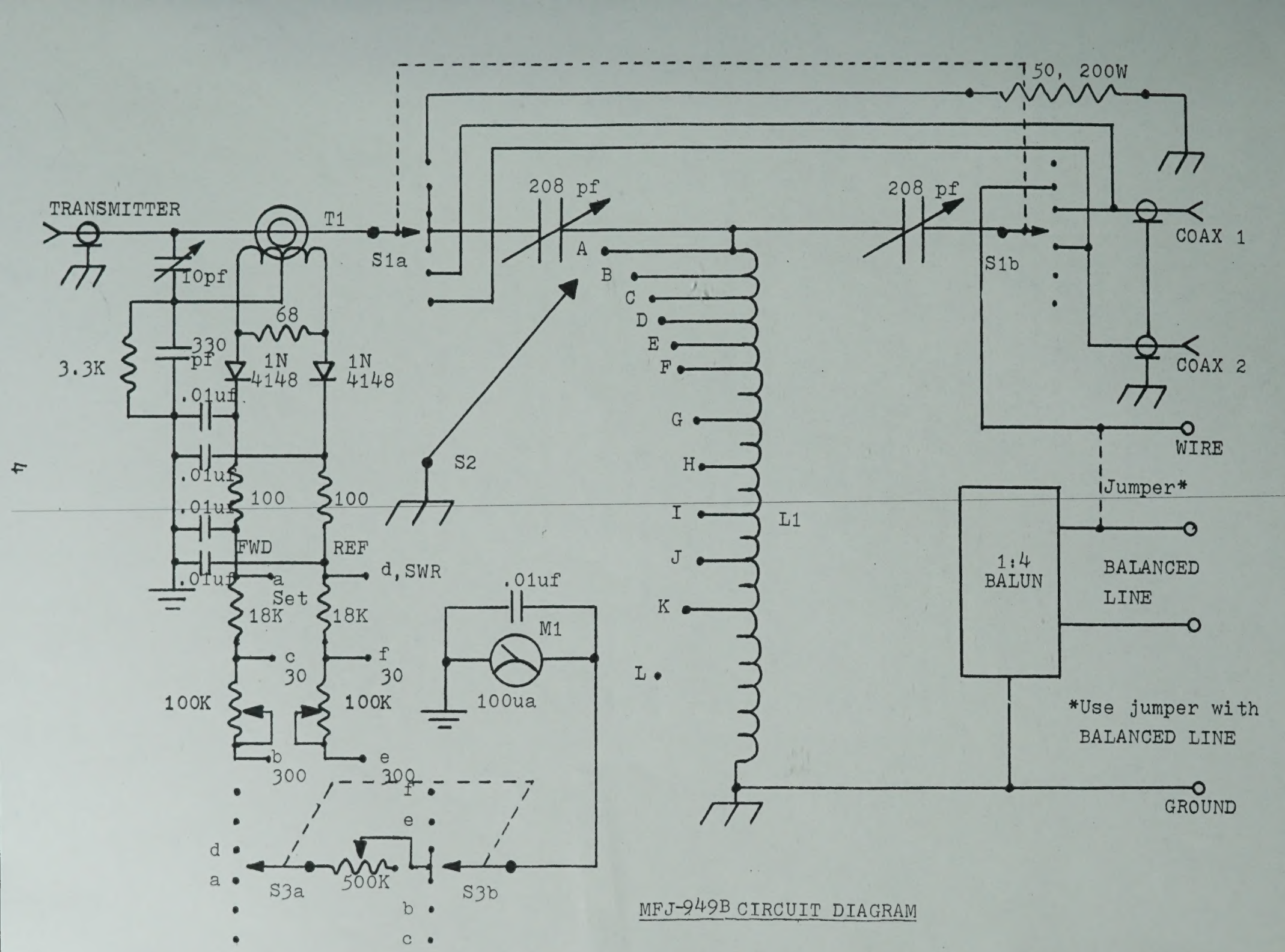
9. After a minimum SWR is achieved, readjust the SWR sensitivity by turning the FUNCTION switch to SET and adjusting the SWR SEN. control. Turn the FUNCTION switch to SWR to read SWR. The transmitter power may now be increased up to 300 watts. The SWR sensitivity must be reset again after full power is applied. The ANTENNA and TRANSMITTER controls may need fine adjustment for minimum SWR at high power. NOTE: This tuner will reduce the SWR of most antenna systems to nearly 1:1. However in some cases a 1:1 SWR may not be achievable. If this happens, try increasing or decreasing length of antenna. Note that a 1.5:1 SWR results only in 4% reflected power and 11% reflected power with a SWR of 2:1.

10. To read the transmitter power, set the FUNCTION switch to 30 or 300 on FWD.

11. To read reflected power simply turn the FUNCTION switch to 30 or 300 on REF.

12. A SWR of 1:1 can occur from more than one set of control settings on the MFJ-949B. When a SWR of 1:1 is obtained, be sure to check the transmitter power and make sure that the transmitter power is relatively high. If the transmitter power has decreased substantially, try another INDUCTOR control setting and repeat Step 7.

13. When using the MFJ-949B for receiving only, tune the MFJ-949B as described in Step 1 and Step 2.



MFJ-949B CIRCUIT DIAGRAM

FULL 12 MONTHS WARRANTY

MFJ Enterprises, Inc. warrants to the original owner of this product, if manufactured by MFJ Enterprises, Inc. and purchased from an authorized dealer or directly from MFJ Enterprises, Inc. to be free of defects in material and workmanship for a period of 12 months from date of purchase provided the following terms of this warranty are satisfied.

1. The purchaser must retain the dated proof-of-purchase (bill of sale, cancelled check, credit card or money order receipt, etc.) describing the product to establish the validity of warranty claim and must submit the original or a machine-reproduction of such proof-of-purchase to MFJ Enterprises, Inc. at the time of warranty service. MFJ Enterprises, Inc. shall have the discretion to deny warranty without dated proof-of-purchase. Any evidence of alteration, erasure, or forgery of proof-of-purchase shall be cause to void any and all warranty terms immediately.
2. MFJ Enterprises, Inc. agrees to repair or replace at MFJ's option without charge to the original owner any defective product provided the product is returned postage prepaid to MFJ Enterprises, Inc. with a personal check, cashier's check or money order for **$4.00** covering postage and handling.
3. MFJ Enterprises, Inc. will supply replacement parts free of charge for any MFJ product under warranty upon request. A dated proof-of-purchase and a **$4.00** personal check, cashier's check or money order must be provided to cover postage and handling.
4. This warranty is **NOT** void for owners who attempt to repair defective units. Technical consultation is available by calling (601) 323-5869.
5. This warranty does not apply to kits sold or manufactured by MFJ Enterprises, Inc.
6. Wired and tested PC board products are covered by this warranty provided **only the wired and tested PC board is returned.** Wired and tested PC boards installed in the owner's cabinet or connected to switches, jacks, cables, etc. sent to MFJ Enterprises, Inc. will be returned at the owner's expense unrepaired.
7. Under no circumstances is MFJ Enterprises, Inc. liable for consequential damages to person or property by the use of any MFJ product.
8. **Out-of-Warranty Service:** MFJ Enterprises, Inc. will repair any out-of-warranty product provided the unit is delivered prepaid. All charges will be shipped COD to the owner.
9. This warranty is given in lieu of any other warranty express or implied.
10. MFJ Enterprises, Inc. reserves the right to make changes or improvement in design or manufacture without incurring any obligation to install such changes upon any of the products previously manufactured.
11. All MFJ products to be serviced in-warranty or out-of-warranty should be addressed to **MFJ Enterprises, Inc., 921A Louisville Road, Starkville, Mississippi 39759, USA** and must be accompanied by a letter describing the problem in detail along with a copy of your dated proof-of-purchase.
12. This warranty gives you specific rights, and you may also have other rights which vary from state to state.